IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

KERR MACHINE CO., Plaintiff, v. VULCAN INDUSTRIAL HOLDINGS, LLC, VULCAN ENERGY SERVICES, LLC, and CIZION, LLC d/b/a VULCAN INDUSTRIAL MANUFACTURING, Defendant.	CIVIL ACTION NO. 6:20-CV-200-ADA JURY TRIAL DEMANDED

DECLARATION OF WILLIAM D. MARSCHER, P.E.

I. INTRODUCTION

1. I have been retained as an expert on behalf of Defendants Vulcan Industrial Holdings, LLC, Vulcan Energy Services, LLC, and Cizion, LLC d/b/a Vulcan Industrial Manufacturing (collectively, "Vulcan") to give my opinion as to the scope and meaning that would have been given to certain terms and phrases appearing in certain claims of U.S. Patent No. 10,591,070 (the "'070 Patent") by a person of ordinary skill in the art ("POSITA") at the time of the invention. I have personal knowledge of the facts stated in the declaration, and I am willing to competently testify to them if and when called to do so.

2. In rendering my opinions, I reviewed intrinsic evidence, including the text of the '070 Patent, its prosecution history, as well as extrinsic evidence. My opinions are based on my years of education, training, research, knowledge and personal and professional experience in the relevant art. I am employed as the CEO and Senior Consultant of the machinery consulting and independent rotating machinery company Mechanical Solutions, Inc. ("MSI"), performing engineering work in the field of fluid systems and their rotating and reciprocating machinery, particularly pumps, compressors, and turbines. As CEO and Senior Consultant of MSI, my typical work responsibilities include leading MSI's technical team in the design, analysis, and testing of all types of plant machinery, as well as other types of fluid and mechanical systems. I have a background in all types of pumps, including positive displacement (*e.g.*, reciprocating, gear, rotary, diaphragm, and screw) as well as centrifugal pumps.

3. I have been informed that the '070 Patent was filed on September 18, 2019, and issued on March 17, 2020. I also understand that the '070 Patent is a divisional of U.S. Patent Application 15/719,124, filed on September 28, 2017, which is a continuation-in-part of U.S. Patent 10,288,178, filed on September 29, 2016. The '070 Patent also claims priority to

Provisional U.S. Patent Application 62/346,915, filed on June 7, 2016, Provisional U.S. Patent Application 62/318,542, filed on April 5, 2016, Provisional U.S. Patent Application 62/315,343, filed on March 30, 2016, and Provisional U.S. Patent Application 62/234,483, filed on September 29, 2015.

4. I understand that Vulcan Industrial Holdings, LLC is the parent company of Cizion, LLC and that Vulcan Energy Services is a sister company of Cizion, LLC. I am not and have never been an employee of Vulcan or any affiliated company. I am being compensated at my normal hourly rate of $508 for my work in this proceeding, including studying this matter, preparing this declaration and providing deposition and trial testimony. My compensation is not contingent upon the outcome of this proceeding or the particular testimony or opinions that I express.

5. The bases for my opinions include the following: (i) my education as a degreed mechanical engineer and licensure as a professional engineer in New Jersey; (ii) my over 50 years of experience in the design, performance, maintenance, and troubleshooting of pumps and related machinery; (iii) my previous experience in reviewing and/or opining on the claims of U.S. patents directed to pumps and related machinery, including bearings, seals, vibration, wear, and erosion issues; and (iv) my review of certain documents as detailed below.

6. I reserve the right to supplement and/or amend by opinions in this declaration based on future positions taken by Plaintiff, its experts, additional documents, testimony, or other information provided by Plaintiff or its witnesses, any orders from the Court, or as otherwise necessary.

II. QUALIFICATIONS AND PROFESSIONAL EXPERIENCE

7. My experience and qualifications are further provided in my *curriculum vitae*, which is attached as Appendix A to this Declaration. My *curriculum vitae* also provides a

select listing of my publications and the legal cases in which I have been involved over the last 8 years.

8. In 1970, I received my Bachelor of Science degree in Mechanical Engineering from Cornell University. Then in 1972, I received by Master of Engineering degree in Mechanical Design also from Cornell University. I also earned a Master of Science degree in Applied Mechanics from Rensselaer Polytechnic Institute in 1976.

9. After receiving my Bachelor of Science degree in Mechanical Engineering, I worked as a senior engineer, for the Bendix Fuel Injection and Fuel Pumps Divisions (now Honeywell division), a senior engineer for Pratt & Whitney commercial aircraft engine division, Director of Mechanics (mechanical engineering) for Worthington Pump HQ, and Manager of Engineering Mechanics for Dresser Worthington Pump Division (later Ingersoll-Dresser Pump and now Flowserve) after its acquisition of Worthington. I was chief mechanical engineer for Worthington and Dresser Pump, at a time when each respective company was one of the world's largest manufacturers of slurry pumps, with applications including coal slurries, sewage, pulp & paper, and even sauerkraut. I was an active participant in supervising design and development of these pumps for Worthington, as well as their analysis and on-site field testing. Later, I became vice president of the independent pump and turbomachinery developer Concepts NREC, from which 25 years ago, I spun off Mechanical Solutions, Inc. as an independent pump and turbomachinery technology company.

10. For 21 years, I have been one of the U.S. voting representatives on the International Standards Organization ("ISO") committee concerning, among other issues, pump dynamic behavior and acceptance standards. I am a past president of the Society of Tribologists & Lubrication Engineers, the primary technical society worldwide for the study

of bearings, sealing, wear, and erosion issues in machinery, and prior to this was the chairperson of the STLE Wear Technical Committee, and of the Sealing Technical Committee, the main concern of which was pump and compressor seals. For the past 40 years, I have been a voting member of the ASTM Wear & Erosion Standards Committee. I am also the past Board of Directors Chairperson for the Machinery Failure Prevention Technology Society (MFPT) of the Vibration Institute. And, I am an 18-year member of the Texas A&M Pump Users Symposium Advisory Committee (essentially the Board of Directors for the Symposium). I am a charter Standards Partner for the Hydraulic Institute ("HI"), the trade association for the pump industry, became the Vice Chair of the pump vibration technical committee for HI, and was HI Standards Partner of the Year for 2018, based on my significant roles in the 9.6.4 and new 9.6.8 standards. I also won the Vibration Institute MFPT Frarey Award for Diagnostics Excellence.

11. I contributed to and served as a reviewer for the first and second editions of the U.S. Department of Energy ("DOE") and Hydraulic Institute's pump sourcebook titled, *Improving Pumping System Performance—A Sourcebook for Industry*, the second edition of which was published in 2006.

12. I have also written ten handbook chapters for various major engineering handbooks, which focus on pump and turbomachinery mechanical issues, including sealing, and component wear and erosion. For instance, the chapter that I authored for the ASM Materials Handbook focused on pump erosion and wear. Further, I have been the associate editor of the Society of Tribologists and Lubrication Engineers' Tribology Transactions magazine for 18 years.

13. I am an inventor on six U.S. Patents and one European Patent, with at least two patents directed toward turbomachinery seals. I have also taught short courses and tutorials on a number of pump topics at leading institutions in the United States and around the world. I am a registered and licensed Professional Engineer in New Jersey (License No. 40626).

III. MATERIALS CONSIDERED

14. In preparing this Declaration, I reviewed and considered the following materials:

- U.S. Patent No. 10,591,070 and accompanying file history (Herman Exs. 1-2);
- U.S. Provisional Application Number 62/234,483 and accompanying file history (Herman Ex. 3);
- Provisional U.S. Patent Application 62/315,343 and accompanying file history (Herman Ex. 4);
- Provisional U.S. Patent Application 62/318,542 and accompanying file history (Herman Ex. 5);
- Provisional U.S. Patent Application No. 62/346,915 and accompanying file history (Herman Ex. 6);
- U.S. Pat. No. 10,288,178 and accompanying file history (Herman Ex. 7);
- U.S. Patent Application No. 15/719,124 and accompanying file history (Herman Ex. 8);
- U.S. Patent Application No. 16/814,267 and accompanying file history (Herman Ex. 12);

- U.S. Patent Application No. 16/897,659 and accompanying file history (Herman Ex. 13);
- U.S. Patent Application No. 16/876,414 and accompanying file history (Herman Ex. 14);
- U.S. Patent No. 6,382,940 (Herman Ex. 9);
- Oxford Dictionary of Mechanical Engineering, excerpted (2013) (Herman Ex. 10);
- Paresh Girdhar, Octo Moniz, & Steve Mackay, Centrifugal Pump Design, Plant and Process Engineering 360º, 521-536 (2004) (Herman Ex. 11); and
- List of claim terms and Kerr and Vulcan's proposed constructions.

IV. LEGAL PRINCIPLES

A. Claim Construction

15. I understand that the first step in analyzing the patentability of a patent claim begins with an analysis of the wording of the claim itself, also referred to as "claim construction."

16. I understand that claim terms should be accorded their ordinary and customary meaning as understood by one of ordinary skill in the art at the time of the invention, in light of the patent specification and the prosecution history pertaining to the patent.

17. I further understand that the preamble to a claim may limit the claim scope when the preamble recites additional structure that is underscored as important by the specification, or when the preamble provides antecedent basis for a claim limitation. It is my understanding that a preamble does not limit the claim scope if the body of the claim describes

a structurally complete invention, and the preamble merely gives a name to the invention or describes a use for the invention.

V. PERSON OF ORDINARY SKILL IN THE ART

18. I understand that the factors considered in determining the level of ordinary skill in the art include: (i) the levels of education and experience of persons working in the field; (ii) the types of problems encountered in the field; and (iii) the sophistication of the technology. I understand that a POSITA is not a specific real individual, but rather a hypothetical individual having the qualities reflected by the factors above.

19. In my opinion, a POSITA at the time of the invention would have a bachelor's degree in mechanical or petroleum engineering, or a comparable engineering discipline, and 3-5 years of work experience in the design and/or manufacturing of reciprocating pumps and valves, including fluid ends and/or comparable high pressure fluid components, for industrial applications, including for use in the oil and gas industry. All of my opinions set forth herein are provided from the perspective of a POSITA at the time of the alleged invention of the '070 Patent.

VI. THE '070 PATENT

20. The '070 Patent is titled "Sealing High Pressure Flow Devices." It generally discloses the sealing of fluid flow passages inside the fluid end of a reciprocating plunger pump. The claims of the '070 Patent are directed to the fluid end assembly and a method of manufacturing the same.

21. Specifically, the '070 Patent describes a fluid end assembly used in "well servicing applications to contain high pressure, often corrosive and/or abrasive, fracturing fluids in the oil and gas industry." '070 Patent at 1:54-56; *see also id.* at 7:10-13. Figure 17

shows a cross-sectional view of a fluid end allegedly constructed in accordance with embodiments of the '070 Patent:

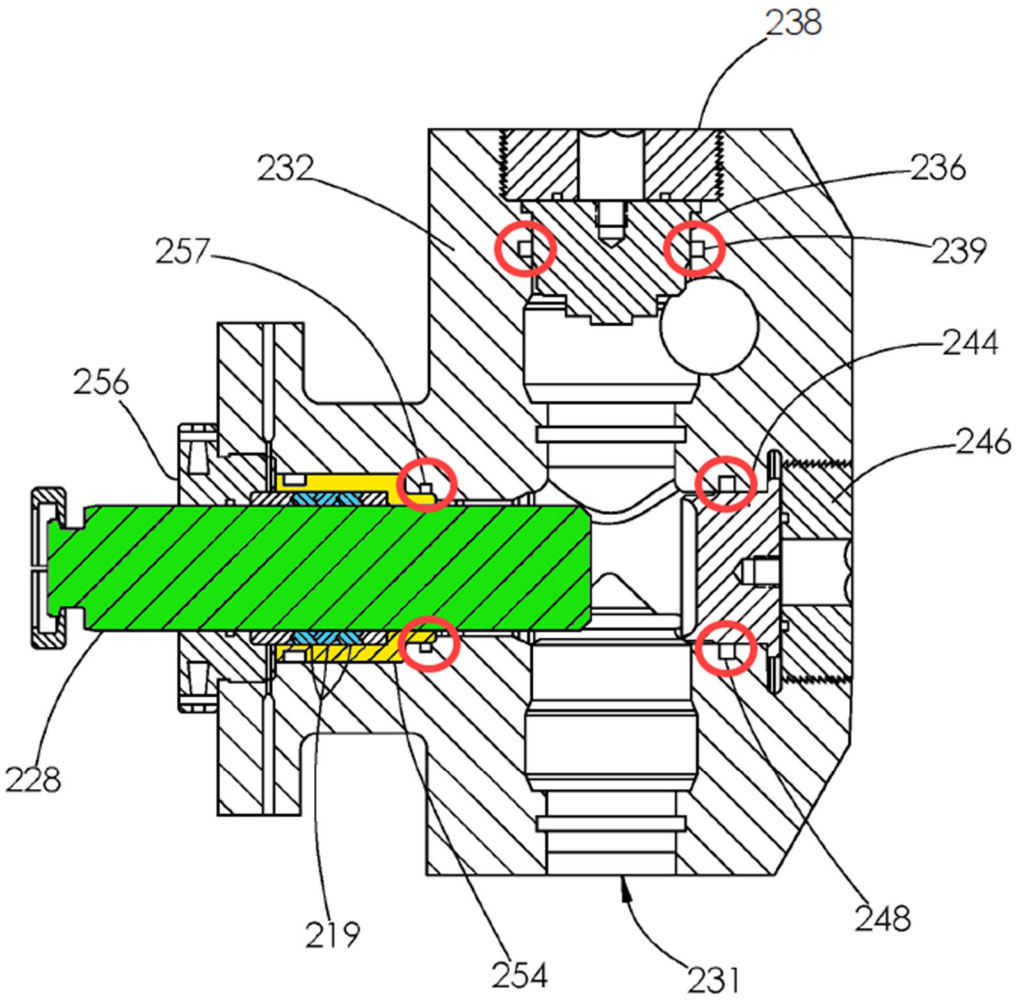


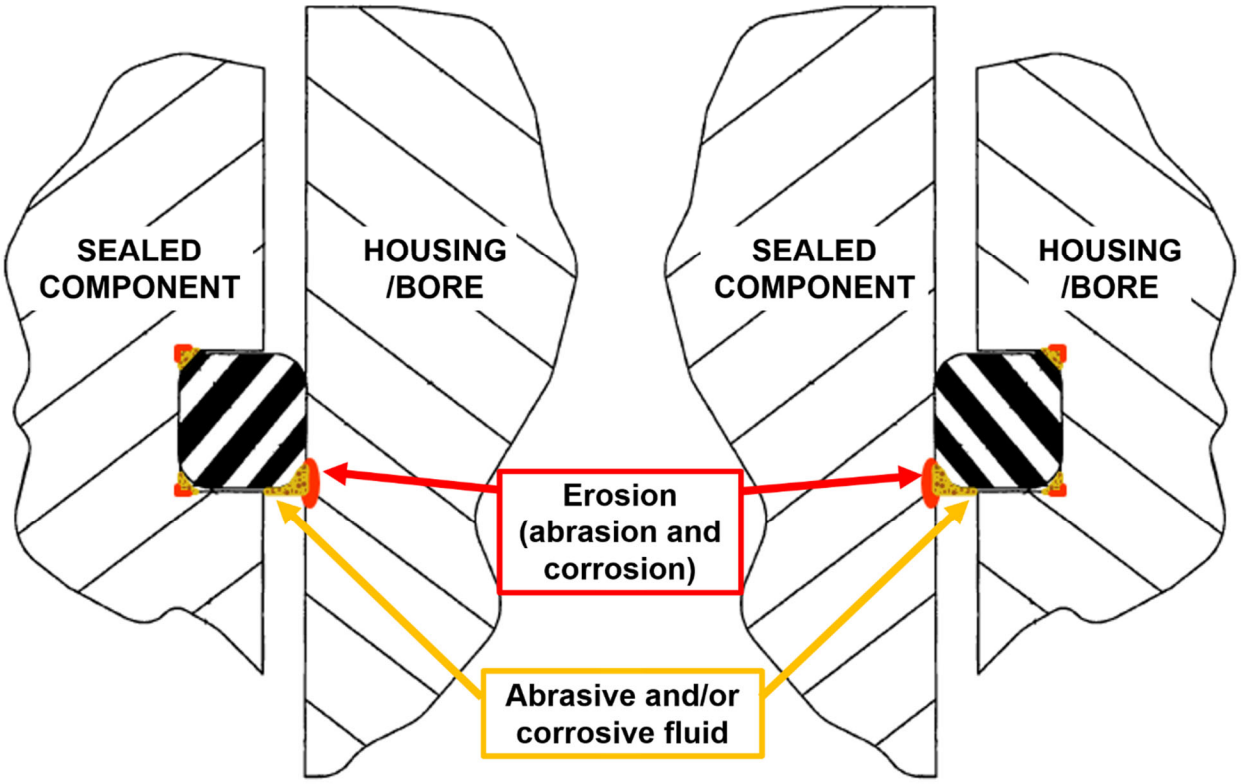
FIG. 17

Id. at Fig. 17 (annotated). The red circles indicate endless grooves and seals in the fluid end housing. The plunger (green) and packing seals (blue) are disposed within a tubular sleeve (yellow). The '070 Patent's (1) placement of grooves and seals in the housing and (2) tubular sleeve are described in more detail below.

A. Placement of the Groove and Seal

22. Operating fluid end assemblies under high pressure with corrosive and/or abrasive fluids "can cause erosion of the body resulting in leakage in a short amount of time." '070 Patent at 1:62-65; *see also id.* at 1:12-17. The '070 Patent describes the prior art approach to containing high pressure fluid inside the valve as having a recess and seal in the insert (the sealed component), where the seal extends from the recess to seal against the valve body bore. *Id.* at 4:50-5:5. According to the '070 Patent, with this approach, "[c]orrosive and/or abrasive fluid can become trapped between the seal 140 (mounted in the insert 106b) and the bore 104 causing erosion of the bore 104." *Id.* at 5:3-5, 5:52-55; *see also id.* at 1:35-41 (noting that "[r]epairing the valve body . . . is a cumbersome and disruptive repair in the oilfield"). Thus, the specification states that "[w]hat is needed is a solution that transfers the erosion (corrosion and abrasion) from the high pressure fluid device body to the component sealed with the body." *Id.* at 1:66-2:4. The '070 Patent purports to achieve this result by placing the recess and seal in the valve body bore/housing, with the seal extending from the recess to seal against the insert/sealed component. *See id.* at 8:60-9:20; *see also id.* at Fig. 17. The specification alleges that this seal construction "transfers the erosion wear from the body to the [sealed component]," which "significantly improves fluid end operations because repairs involving the [sealed component] are significantly less complex and less expensive than repairs involving the body." *Id.* at 9:15-30.

23. The alleged prior art approach is illustrated on the left in the figure below and shows a majority of the erosion occurring on the bore/housing. The '070 Patent approach of placing the groove and seal in the bore/housing to purportedly "transfer the erosion" to the sealed component is illustrated on the right.



'070 Patent at Figs. 12 & 13 (annotated).

B. Stuffing Box Sleeve

24. The '070 Patent also teaches a stuffing box sleeve ("tubular sleeve"), where the plunger and the packing seals (blue) are disposed within the tubular sleeve. '070 Patent at 10:1-3; *see infra* Part VII.A.

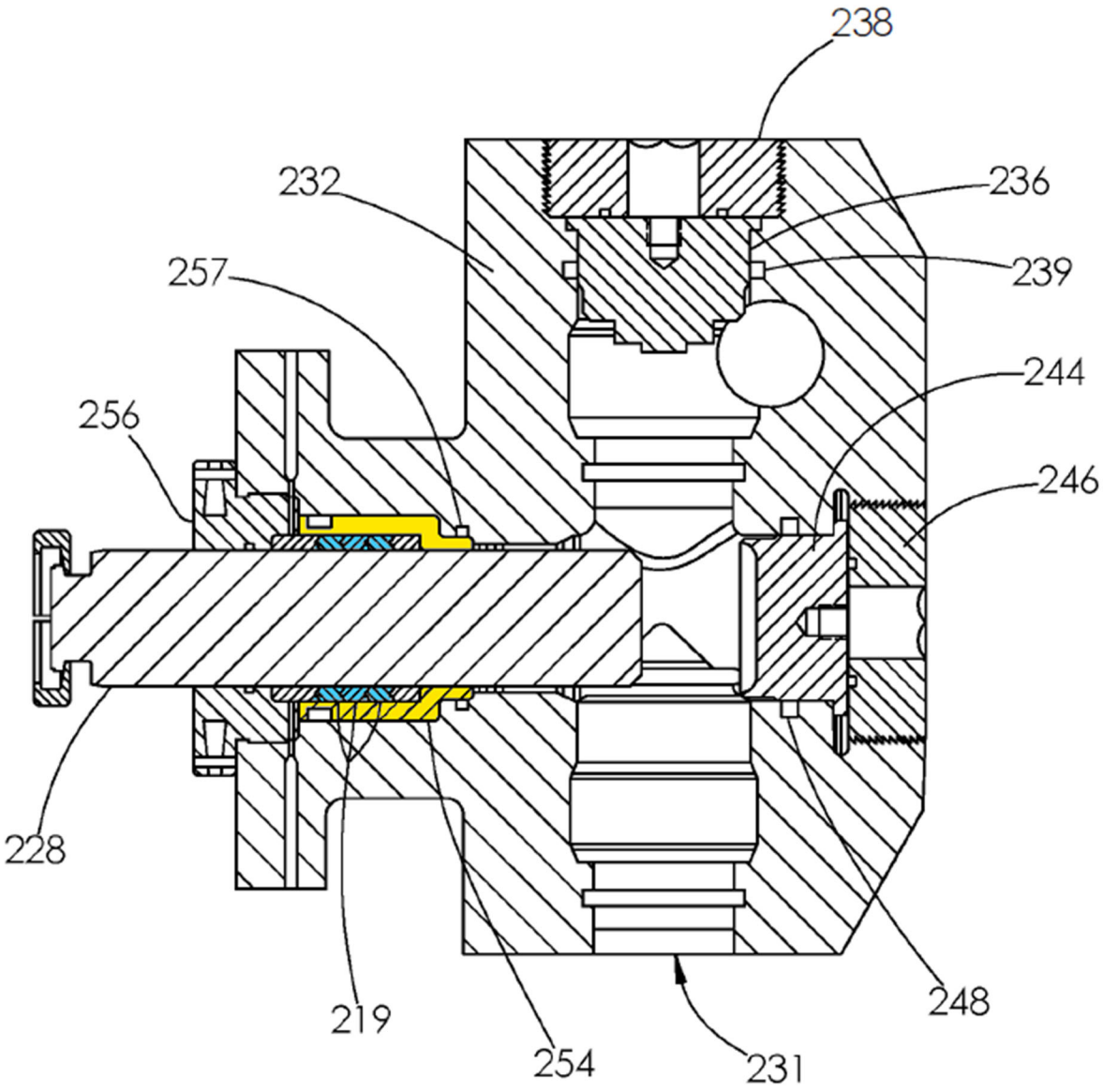


FIG. 17

'070 Patent at Fig. 17 (annotated).

25. The '070 Patent further indicates that—aside from the allegedly novel placement of the seal and groove in the housing as opposed to in the sleeve—such sleeves (254) were known in the prior art. *Id.* at 11:26-39 ("FIG. 16 also depicts a conventional construction of the seal 286 that is mounted in a recess formed by the stuffing box

sleeve 254 and extends from that recess to seal against the body bore defining the plunger opening 250.") (emphasis added).

26. The '070 Patent has two independent claims, claims 1 and 6. Claim 1 claims a method of manufacturing a fluid end assembly comprising certain characteristics, and claim 6 claims a fluid end assembly comprising the same characteristics. Both independent claims recite, among other things, (1) an endless groove in the housing, with a seal positioned within the groove, and (2) a tubular sleeve which has a plurality of packing seals disposed within. Claim 1 includes certain representative subject matter and recites:

> 1. A method of manufacturing the fluid end assembly, comprising:
>
> providing a housing having a first conduit extending therethrough, and a second conduit extending therethrough that intersects the first conduit;
>
> forming an endless groove in the housing such that the groove surrounds the second conduit;
>
> positioning a seal within the groove;
>
> installing a tubular sleeve within the second conduit such that at least a portion of the sleeve engages with the seal;
>
> installing a plurality of packing seals within the sleeve; and
>
> installing a reciprocating plunger at least partially within the sleeve and the plurality of packing seals.

'070 Patent at 12:40-54.

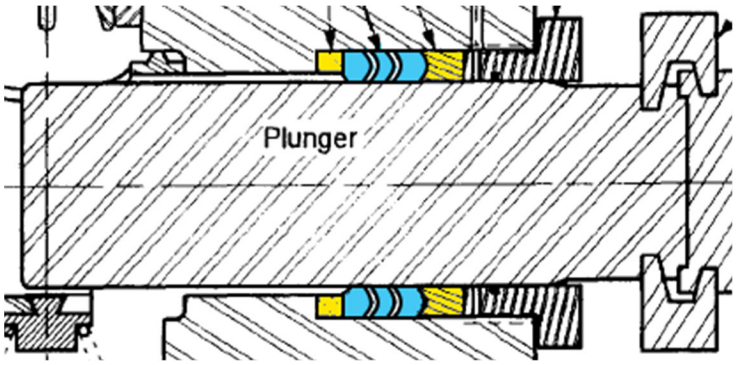
27. The dependent claims recite additional limitations. Specifically, dependent claims 2, 3, 10, 11, and 12 are directed to characteristics of the groove and seal in the housing. Further, dependent claims 5, 15, 16, 18, and 19 are directed to additional grooves and seals in the fluid end assembly housing. Dependent claims 4, 7, and 8 recite a plug/closure element within the first conduit, and dependent claim 17 recites a valve within the first conduit. Dependent claim 9 recites that the conduits are orthogonal. Dependent claims 13, 14, 20, and

21 recite pressure and horsepower limitations. Finally, dependent claims 22, 23, and 24 are directed to the sleeve.

C. Prosecution History

28. The '070 Patent issued from U.S. Patent Application Number 16/574,918, filed September 18, 2019 (Herman Ex. 2), claiming benefit to a series of earlier patent applications (Herman Exs. 3-8), beginning with U.S. Provisional Application Number 62/234,483, filed September 29, 2015 (Herman Ex. 3).

29. During prosecution of the application leading to the '070 Patent, on November 26, 2019, the PTO issued a non-final office action rejecting all claims either under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 6,382,940 ("Blume '940") or under 35 U.S.C. § 103, with Blume '940 being the primary reference. Herman Ex. 2 at 59-62. The Examiner primarily relied on Blume '940 Figures 1 and 3-5, which show, *inter alia*, packing seals (blue) sandwiched between the brass (yellow):

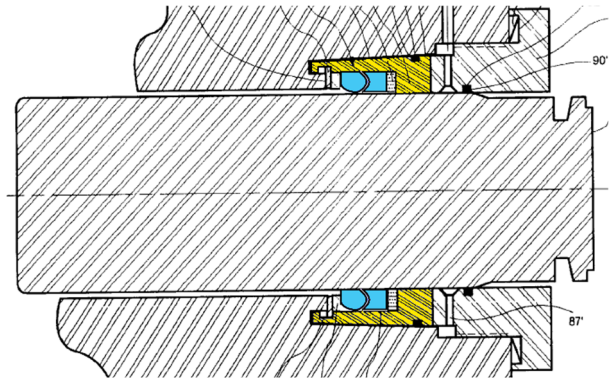
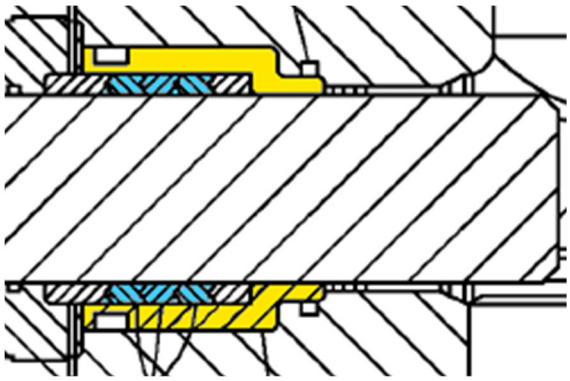


Herman Ex. 9 at Fig. 1 (cropped and annotated); *see also id.* at Fig. 5.

30. In response, Kerr argued that Blume '940 fails to disclose (1) the tubular sleeve (with packing seals disposed within the sleeve) and (2) the groove and seal in the plunger bore housing:

> Claim 1 requires "a plurality of packing seals disposed within the sleeve." The packing seals disclosed in Blume ['940] are sandwiched between the brass. The packing seals are not "disposed within" the packing brass. Only the plunger is disposed within the packing brass. Thus, Blume ['940] does not teach or disclose this feature and claim [1] is not anticipated by Blume ['940].
>
> . . .
>
> Blume ['940] does not teach or disclose another groove and seal within the plunger bore like the groove 257 and seal 258 shown in Applicants' Figures 13 and 17.

Herman Ex. 2 at 47-48. However, Kerr's assertion that Blume '940 does not teach the sleeve limitations ignores Blume '940 Figures 8, 10-12, and 14 (not cited by the Examiner), all of which show packing seals (blue) disposed within a sleeve (yellow) (much like '070 Patent Fig. 17, below, and unlike Blume '940 Fig. 1, above):

Blume '940 Fig. 14 (cropped and annotated), disclosing the sleeve limitations:	**'070 Patent Fig. 17 (cropped and annotated):**
	

31. Kerr acquiesced to the Examiner's finding that Blume '940 discloses (1) a fluid end assembly comprising a housing having a first conduit extending therethrough and a second conduit extending therethrough that intersects the first conduit, (2) a plug sized to fully block fluid flow within the first conduit, (3) a second endless groove formed in the housing

such that the second groove surrounds the first conduit, and a seal positioned with the second groove, and (4) a valve positioned in the first conduit. Kerr further acquiesced to the Examiner's finding that secondary prior art references disclosed the '070 Patent's PSI and horsepower limitations. *See* Herman Ex. 2 at 38-51. The Examiner issued a Notice of Allowance on February 3, 2020, and the '070 Patent issued on March 17, 2020. However, Kerr's sole purported bases for patentability—(1) the tubular sleeve with packing seals disposed within the sleeve (actually disclosed in Blume '940, but not appreciated by the Examiner), and (2) and the groove and seal in the plunger bore housing—are identically disclosed in the prior art.

32. Moreover, during prosecution of U.S. Patent No. 10,288,178, the grandparent of the '070 Patent, the Examiner issued an Office Action on April 27, 2018, rejecting the claims as obvious, focusing on the prior art's disclosure of a groove and seal in the housing. *See* Herman Ex. 7 at 71-80. In response, Kerr argued that "[a]t the time of Applicants' invention, machining techniques known in the art did not allow the creation of such a non-planar groove" in a valve body's curved surface, that "[s]uch a procedure was commonly thought to be impossible." *Id.* at 55. In support, Kerr submitted two declarations attesting that at the time of its alleged invention, the groove in the housing was "impossible to machine" and that Kerr had to modify dental tools to inform its machining process. *Id.* at 60-65. However, contrary to Kerr's assertions, techniques for machining grooves in the interior walls of fluid flow devices were known in the art.

VII. CLAIM CONSTRUCTION

33. I have reviewed the claims, specification, and prosecution history of the '070 Patent and the prosecution history of its continuation application (Application No. 16/814,267) in order to determine the meaning of the eight disputed claim terms.

A. "tubular sleeve"

34. "[T]ubular sleeve" appears in claims 1 and 6. A POSITA would have understood that the claims use the term "tubular sleeve" to mean an "open, substantially cylindrical-shaped stuffing box sleeve[1]."

35. The specification states that "[t]he stuffing box sleeve 254 is characterized by a tubular sleeve." '070 Patent at 9:67-10:1 (emphasis added); *see also id.* at 2:49-53 (describing the fluid end assembly as "compris[ing] a stuffing box . . . having a tubular side wall") (emphasis added). Stuffing box sleeve 254 is depicted in Figure 16 and described as "the open-cylinder-shaped stuffing box sleeve 254." *Id.* at 11:40-42 (emphasis added).

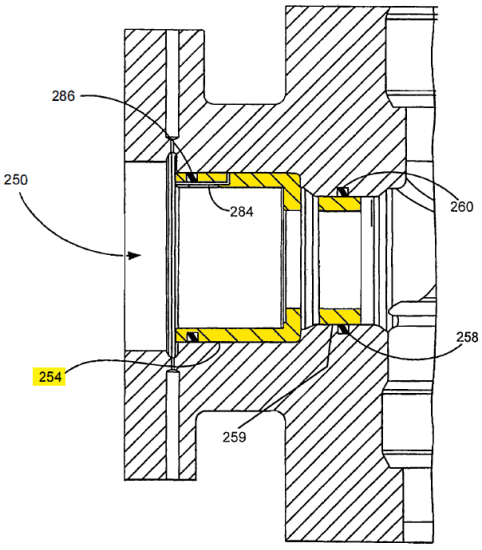


FIG. 16

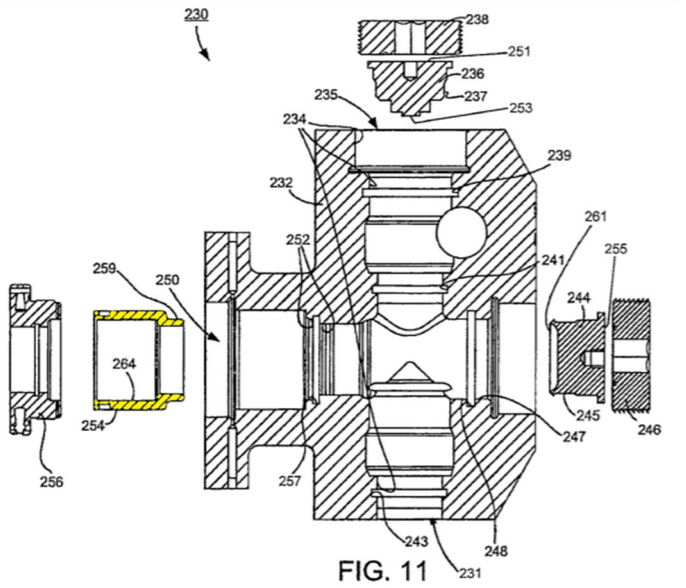


FIG. 11

[1] This definition slightly differs from the opinion submitted in my declaration in PGR2020-00065. I changed "stuffing box housing" to "stuffing box sleeve" because the jury may be more familiar with the term "sleeve" versus "housing." To me, there is no material difference between the two. I also understand that Vulcan's counsel's proposed definition for the district court case removed the further definition of "stuffing box" as "an enclosure containing seals to prevent leakage around a moving machine part." If the Court believes it would be helpful to the jury, that further definition of "stuffing box" is consistent with how a POSITA would understand the term.

'070 Patent at Figs. 16 and 11 (annotated). The specification further provides that "[i]n yet other contemplated embodiments the stuffing box sleeve 254 can be modified to a construction combining a substantially cylindrical-shaped stuffing box to which is mated a seal surface insert that provides the sealing surface 259 (FIG. 11)." *Id.* at 11:53-57 (emphasis added); *see id.* at Fig. 11.

36. Stuffing box sleeve 254 (yellow) is further illustrated in Figure 17, with the plunger 228 and packing seals 219 (blue) disposed within stuffing box sleeve 254:

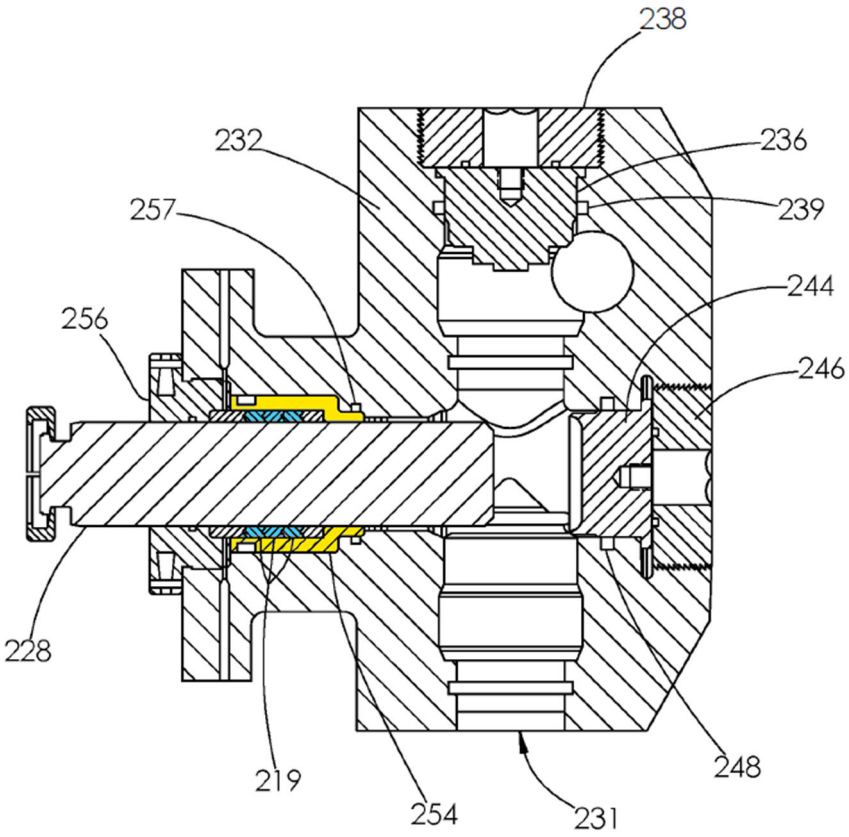


FIG. 17

Id. at Fig. 17 (annotated), 10:1-3.

37. In each of Figures 11, 16, and 17 shown above, the outer diameter of the stuffing box sleeve (shown in yellow) longitudinally tapers from left to right such that the overall shape of the stuffing box sleeve is substantially cylindrical.

38. The prosecution history of application No. 16/814,267, a continuation of the '070 Patent, shows that Kerr specifically amended its pending claims to claim a cylindrical front portion and a cylindrical rear portion of the tubular sleeve but did not claim a primarily cylindrical or cylindrical sleeve. Herman Ex. 12 at 47.

39. A POSITA would have understood "stuffing box" to mean "an enclosure containing seals to prevent leakage around a moving machine part." *See* Herman Ex. 10 at 10 (defining "stuffing" as "[p]acking material used to create a pressure-tight seal in the annular space between a rod and a cylinder"); Herman Ex. 11 at 13 ("The stuffing box is a chamber or a housing that serves to seal the shaft where it passes through the pump casing.").

40. Thus, in light of the '070 Patent specification and the prosecution history of its related application, one of ordinary skill in the art would have understood that the term "tubular sleeve" means an "open, substantially cylindrical-shaped stuffing box sleeve."

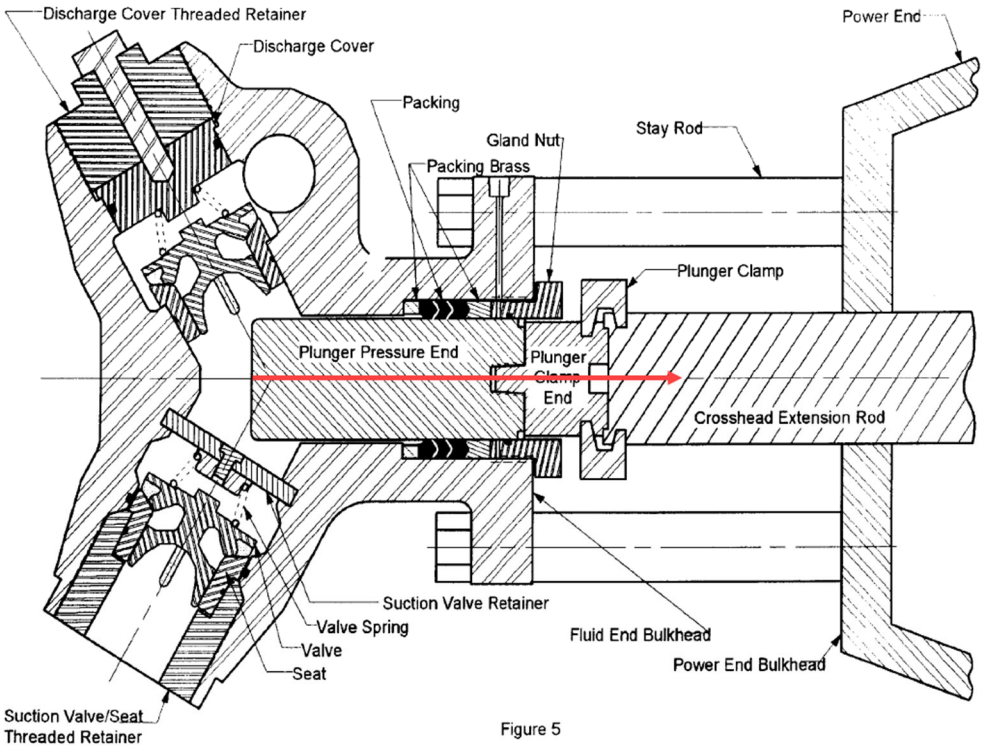
B. "therethrough"

41. "[T]herethrough" appears in claims 1 and 6. A POSITA would have understood that the claims use the term "therethrough" to mean "into (the housing)."

42. The specification describes "a housing having an external surface and an internal chamber, and a first conduit formed in the housing and having first and second sections, each section independently interconnecting the internal chamber and the external surface" and "a second conduit formed in the housing, intersecting the first conduit and independently interconnecting the internal chamber and the external surface." '070 Patent at

2:13-20 (emphasis added). The interconnecting of the internal chamber and the external surface occurs when the conduit extends into the housing.

43. During prosecution, the Examiner found that U.S. Patent No. 6,382,940 ("Blume '940") has "a first conduit (Figs. 1 and 3-5, one of the conduits in which the Valves and Seats are in) extending therethrough, and a second conduit (Figs. 1 and 3-5, the conduit in which the Plunger is in) extending therethrough that intersects the first conduit." Herman Ex. 2 at 59. That is, the Examiner read the "therethrough" limitation onto the Y-bore body of Blume '940 Figure 5, finding that "the conduit in which the Plunger is in" satisfies the "second conduit extending therethrough" limitation:



Herman Ex. 9 at Fig. 5 (annotated). The Applicant acquiesced to the Examiner's finding. *See generally* Herman Ex. 2 at 38-51.

44. That a plunger conduit such as in Blume '940 Figure 5 satisfies the limitation of "a second conduit extending therethrough" is further evident from the specification of the

'070 Patent, which provides, "[t]he body 232 also forms a plunger opening 250 sized to closely receive a stuffing box sleeve 254 that is sealed in place by advancing a retaining nut 256." '070 Patent at 9:64-66; *see also id.* at 11:14-50 (repeatedly referring to "the body bore defining the plunger opening 250") (emphasis added).

45. Kerr's proposed construction, "from one side or surface to the opposing side or surface," improperly attempts to rescind its prior claim construction understanding. In other words, in order to get its claims allowed by the PTO, Kerr agreed that "therethrough" meant "into (the housing)" from an external surface of the housing to an internal chamber of the housing as described in the specification. *See* '070 Patent at 2:13-20, 7:19-30, Fig. 9.

46. In light of the specification and prosecution history, one of ordinary skill in the art would, therefore, have understood that the term "therethrough" means "into (the housing)."

C. "endless groove"

47. "[E]ndless groove" appears in claims 1, 5, 6, 15, and 18. I understand that Kerr filed related patent applications that claimed "endless groove," and the Examiner rejected those claims as indefinite. Herman Ex. 13 at 20 ("It is unclear how a structure can be 'endless.'"); Herman Ex. 14 at 83 ("It is unclear how a structure can be 'endless' as it has finite dimensions."). In the '414 application, in its responses both on September 23, 2020 and October 8, 2020, applicant amended "endless groove" to "annular groove" in the rejected claims without protest. Herman Ex. 14 at 45 (stating "[t]he Examiner rejected claim 6 because it is unclear as to the limitation of 'an endless groove' in this claim. Applicant has amended claim 6 to recite 'an annular groove.'"); Herman Ex. 14 at 1-11 (maintaining "annular groove" amendment). Upon reflection, I agree with the Examiner that the term "endless groove" would not provide a POSITA with reasonable certainty as to the scope of the term "endless groove." By way of example, a POSITA may think that "endless" refers to the width of the

groove, i.e. it could be of infinite width. Here, a POSITA would not understand the meaning of "a channel or recess without beginning or end," so if Kerr's proposed construction were to be adopted, a POSITA would not understand what is, and what is not, covered by the claim, rendering it indefinite. To the extent the Court determines that the term "endless groove" is not indefinite, a POSITA would have understood that the claims use the term "endless groove" to mean an "annular/concentric channel or recess."[2]

48. The specification uses the phrase "endless groove or recess" eight times, including in the description of illustrative embodiments. *See, e.g.*, '070 Patent at 9:56-60 (stating that "the body 232 in these illustrative embodiments has a surface 248 forming an endless groove or recess intersecting the bore 247") (emphasis added), 9:31-49.

49. The specification illustrates the "endless groove or recess" as a channel:

[2] This definition slightly differs from the opinion submitted in my declaration in PGR2020-00065. I added "concentric" because the jury may be more familiar with the term "concentric" versus "annular" and both "concentric" and "annular" are used in the specification.

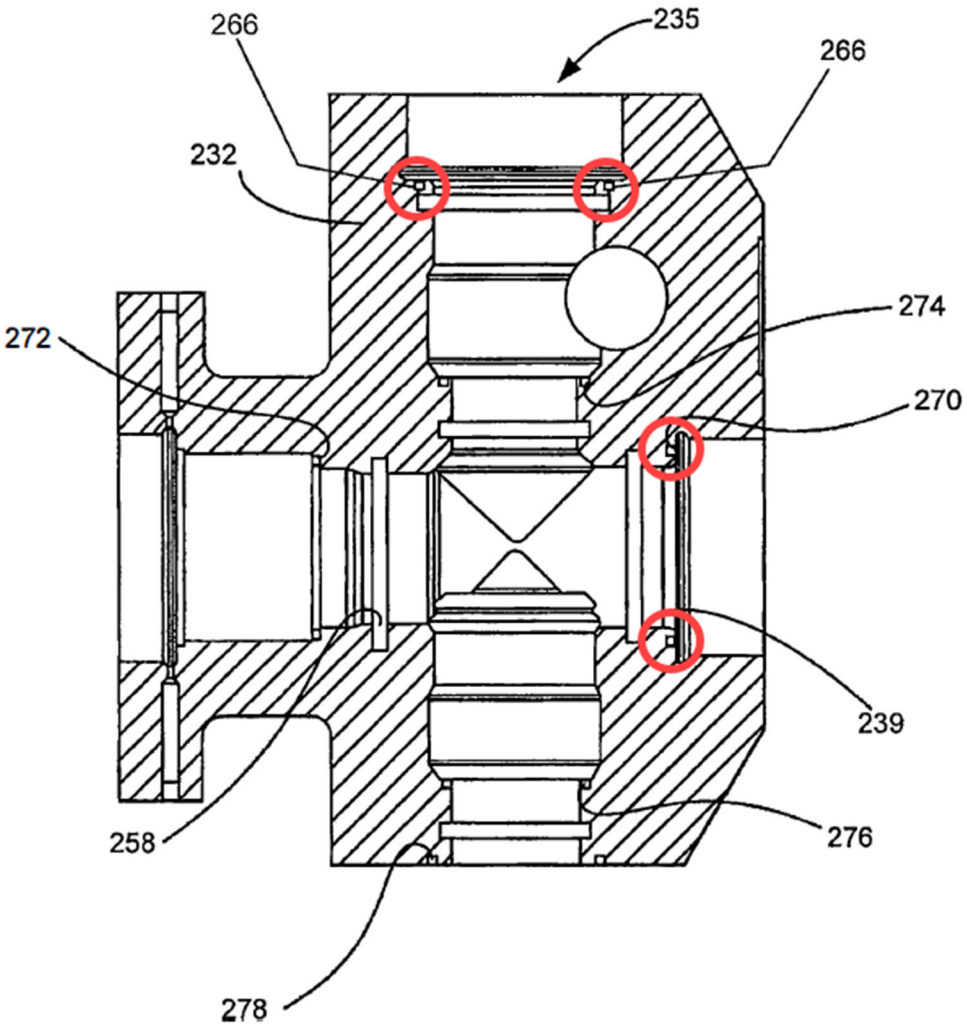


FIG. 14

Id. at Fig. 14 (annotated); *see also id.* at Fig. 17. Labels 266 and 270 show annular channels. A close-up of surface 266 forming "recess 273"—which has an annular channel shape—is shown below:

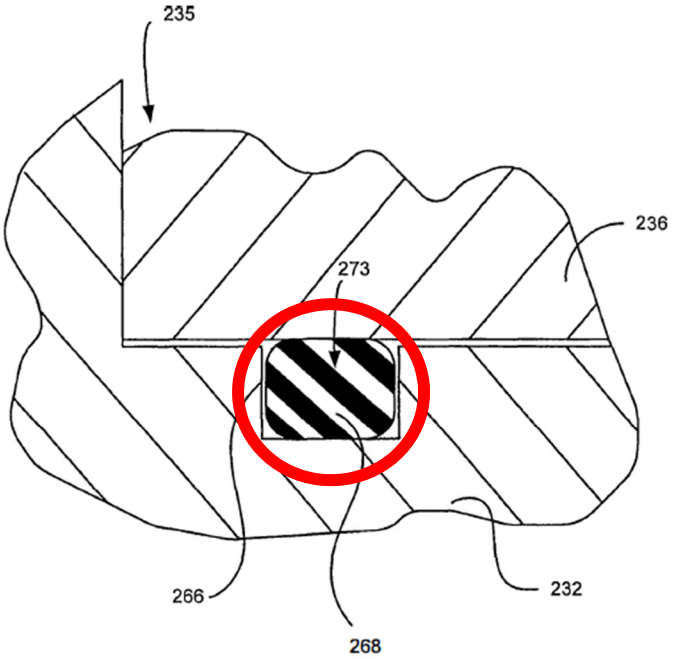


FIG. 15

Id. at Fig. 15 (annotated).

50. The specification further makes clear that recesses are within the scope of the invention by stating that "the rectangular-groove shape of the recess 240 is merely illustrative and not limiting of the contemplated embodiments. Any shape necessary to properly mount a desired seal is contemplated." *Id.* at 9:5-14 (emphasis added). Specifically, the "scope of the claimed technology" includes "a recessed corner having two walls that extend concentrically around the bore," as depicted by surface 272 in Figure 14:

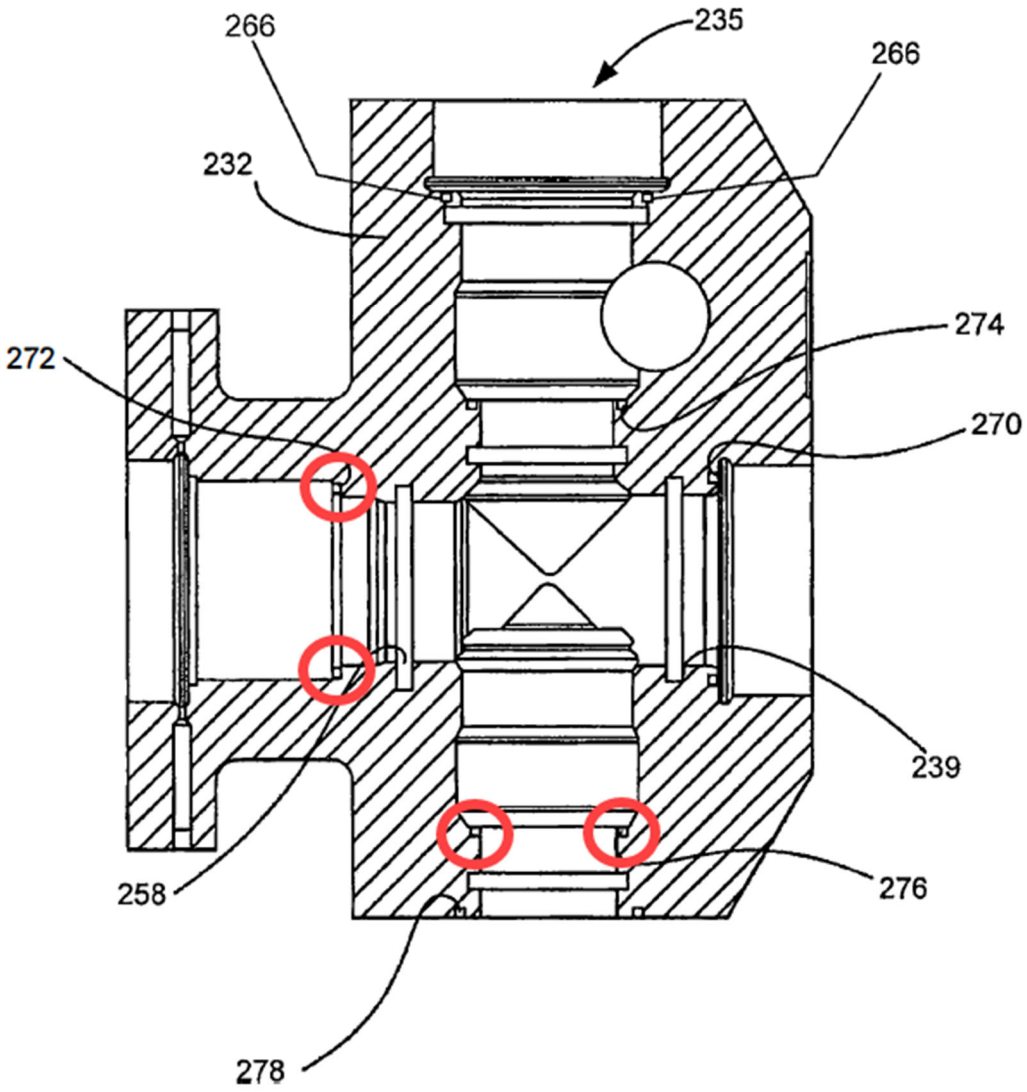


FIG. 14

Id. at 10:45-11:9 (emphasis added), Fig. 14 (annotated to show recessed corners, including 272); *see also id.* at 2:40-53 (describing the "present invention" as the "fluid end assembly further comprises a recessed corner section formed in the wall or walls defining one of the conduits and extending concentrically around that conduit" where "[t]he corner element is sized to receive a sealing element therein") (emphasis added). Thus, one of ordinary skill in the art, in light of the specification, would have understood the "groove" limitation to include channels and recesses.

51. Regarding the word "endless," the specification describes "an endless groove formed in the wall or walls defining one of the conduits and extending concentrically around that conduit." *Id.* at 2:11-22 (emphasis added); *see also id.* at 2:37-39. The specification further describes "an annular groove formed in the housing." *Id.* at 2:23-28 (emphasis added). One of ordinary skill would have understood "endless" and "concentric" to be synonymous with "annular."

52. One of ordinary skill in the art would, therefore, have understood that the term "endless groove" means an "annular/concentric channel or recess."

D. "seal"

53. "[S]eal" appears in claims 1, 6, 11, 16, 19, and 23. A POSITA would have understood that the claims use the term "seal" to mean an "annular/concentric component of elastomeric, spring, metal, or similar material that presses tightly against a surface upon axial and/or radial compression."[3]

54. The specification provides that "[t]he seal 140 can be an elastomeric seal, and in other embodiments other kinds of seals can be used such as metal seals, spring seals, and the like." '070 Patent at 5:14-17 (emphasis added); *see id.* at 9:7-9 ("[a]ny shape necessary to properly mount a desired seal is contemplated, whether the seal is elastomeric, spring, metal, and the like"). The specification describes both axial and radial compression. *Id.* at 5:5-9 (describing an "axial seal" where "compressive forces from the surface 108*b* on one side and the bore 104 on the other side act in an axial direction relative to the annular seal

[3] This definition slightly differs from the opinion submitted in my declaration in PGR2020-00065. I added "concentric" because the jury may be more familiar with the term "concentric" versus "annular." Also, upon further reflection, it would make more sense to remove the comma between "spring" and "metal" in this context. I assume that is a typographical error in the patent specification.

140"), 5:27-33 (describing radial, axial, and crush seals), 10:50-59 ("A crush seal refers to a seal construction that acts at least to some degree both axially and radially."). The specification further describes the seal being sized "so that a portion of the seal 242 . . . extends beyond the recess 240 and beyond the bore 234 to pressingly seal against the sealing surface." *Id.* at 9:7-14 (emphasis added); *see also id.* at 10:16-21. The specification also describes the "endless groove" or recess 240 being "formed in the wall or walls defining one of the conduits and extending concentrically around that conduit" and "an annular groove formed in the housing." '070 Patent at 2:20-28 (emphasis added); *see also id.* at 2:37-39 ("groove extends concentrically around that section").

55. In light of this disclosure, one of ordinary skill in the art would, therefore, have understood that the term "seal" means an "annular/concentric component of elastomeric, spring, metal, or similar material that presses tightly against a surface upon axial and/or radial compression."

E. "closure element"

56. "[C]losure element" appears in claims 7 and 8. A POSITA would have understood that the claims use the term "closure element" to mean a "component that is attached or otherwise joined to a housing to provide a fluid seal between the housing and the component."[4]

57. The specification provides that "the term 'closure' means a component that is attached or otherwise joined to the body to provide a high-pressure fluid seal between the

[4] This definition slightly differs from the opinion submitted in my declaration in PGR2020-00065. I changed "body" to "housing" because the jury may be more familiar with the term "housing" versus "body."

body and the closure." '070 Patent at 11:67-12:16 (emphasis added). An example of a closure allegedly is illustrated in Figure 17 of the '070 Patent:

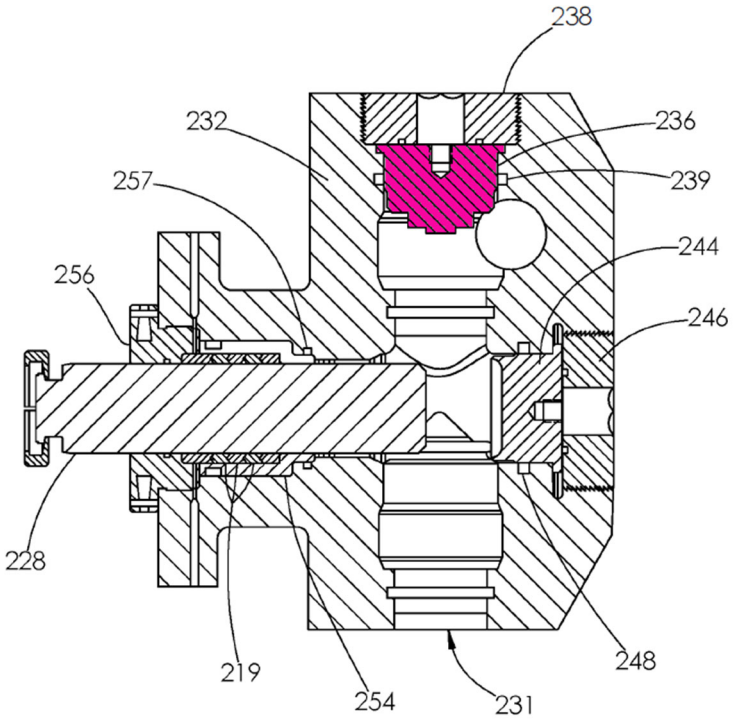


FIG. 17

Id. at Fig. 17 (annotated), 8:31-38 (describing 236 as "a closure or discharge plug") (emphasis added).

58. I understand that claims are not afforded their plain and ordinary meaning where the patentee acts as his/her own lexicographer. Here, the patent applicant expressly set forth a definition of "closure element" and expressed an intent to define the term. Therefore, a POSITA would have understood, in light of the specification, that the patentee acted as its own lexicographer and defined "closure element."

59. One of ordinary skill in the art would, therefore, have understood that the term "closure element" means a "component that is attached or otherwise joined to a housing to provide a fluid seal between the housing and the component."

F. "the seal is engaged with the outer surface of the sleeve"

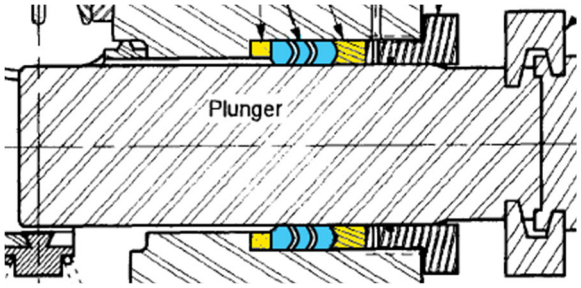
60. "[T]he seal is engaged with the outer surface of the sleeve" appears in claim 23. A POSITA would have understood that the claim uses the term "the seal is engaged with the outer surface of the sleeve" to mean "the seal in the groove in the housing contacts the outer surface of sleeve."

61. I understand that the parties have agreed to the construction of the term "at least a portion of the sleeve engages with the seal" wherein "the seal" referenced there means "the seal in the groove in the housing" and "engages" means "contacts." Based on this agreement, a POSITA would, therefore, have understood that the term "the seal is engaged with the outer surface of the sleeve" means "the seal in the groove in the housing contacts the outer surface of sleeve."

G. "within the sleeve"

62. "[W]ithin the sleeve" appears in claims 1 and 6. A POSITA would have understood that the claims use the term "within the sleeve" to mean "bounded by an inner surface of the sleeve."

63. The '070 Patent specification describes that the stuffing box "sleeve 254 also protects the bore 252 from erosion by providing an inner diameter surface 264 against which the stuffing box packing 219 (shown in FIG. 17) seals." '070 Patent at 11:58-61; *see also id.*, at 10:1-3 ("The plunger 228 and packing seals 219, shown in FIG. 9 and FIG. 17, may be disposed within the stuffing box sleeve 254."). Thus, the specification describes "within the sleeve." However, during prosecution, the Examiner primarily relied on Blume '940 Figures 1 and 3-5, which show, inter alia, packing seals (blue) sandwiched between the brass (yellow):



Herman Ex. 9 at Fig. 1 (cropped and annotated); *see also id.* at Fig. 5. In response, Kerr argued that "the packing seals disclosed in Blume ['940] are sandwiched between the packing brass [annotated in yellow]. The packing seals are not 'disposed within' with packing brass. Only the plunger is disposed within the packing brass." Herman Ex. 2 at 47-48. Thus, Kerr argued that the packing seals must be bounded by an inner surface of the sleeve in order to be "within the sleeve."

64. One of ordinary skill in the art would, therefore, have understood the term "within the sleeve" means "bounded by an inner surface of the sleeve."

H. "fluid end assembly"

65. A POSITA would have understood that the term "fluid end assembly" in the preamble does not limit the claims.

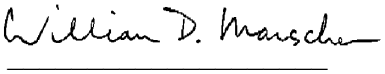
66. Each of the claims recites "[a] fluid end assembly" in the preamble, but never refers back to the preamble fluid end assembly in the remainder of the claim. Also, "fluid end assembly" is not additional structure identified as important by the specification. While the specification acknowledges that fluid end assemblies are one use for the invention, it is not limited to such uses. '070 Patent at 3:34-45 ("[T]he disclosed technology is not limited to use in sealing valves and fluid ends as described in the illustrative embodiments. Thus, although the instrumentalities described herein are for the convenience of explanation, shown and described with respect to exemplary embodiments, the skilled artisan understands that the

principles herein may be applied equally in sealing other types of high pressure flow devices.").

67. Based upon the specification, a POSITA would have understood that the disclosed apparatus and methods could be used for other high pressure flow devices, such as, e.g., valves. The intended use of the apparatus would not change the disclosed structure of the apparatus. A POSITA would have understood that the preamble is merely a statement of purpose or intended use for the claimed inventions. Therefore, the preamble is not limiting.

I declare under penalty of perjury under the law of the United States that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: October 15, 2020

By 

William D. Marscher, P.E.

APPENDIX A

Mechanical Solutions, Inc.
Engineering Analysis, Test & Technology

William Donnelly Marscher, P.E.
Mechanical Solutions Inc.
CEO & Senior Consultant

William D. Marscher is employed as CEO and Senior Consultant of the machinery consulting and independent rotating machinery company Mechanical Solutions, Inc. (MSI), performing engineering work in the field of fluid systems and their rotating and reciprocating machinery, particularly pumps, compressors, and turbines. His typical work responsibilities include backing up MSI's technical team in design, analysis, and testing of all types of plant machinery, as well as other types of fluid and mechanical systems. Mr. Marscher has background in all types of pumps, including centrifugal as well as positive displacement (e.g. reciprocating, gear, rotary, diaphragm, and screw) pumps.

For 21 years, Mr. Marscher has been one of the U.S. voting representatives on the ISO (International Standards Organization) TC108 committee concerning, among other issues, pump dynamic behavior and acceptance standards. He is past president of the Society of Tribologists & Lubrication Engineers (STLE), the primary technical society worldwide for the study of bearings, sealing, wear, and erosion issues in machinery. For the past 40 years he has been a voting member of the ASTM Fatigue Standards Committee, as well as the ASTM Wear & Erosion Standards Committee. He is also the past Board of Directors Chairman for the Machinery Failure Prevention Technology Society (MFPT) of the Vibration Institute. Mr. Marscher is an 18 year member of the Texas A&M Pump Users Symposium Advisory Committee (essentially the Board of Directors for the Symposium). For ASME, Mr. Marscher was Chair of the Predictive Maintenance committee, and was Organizing and Presiding Chair of the 1993 RoCon Rotating Machinery Conference and the 1995 Tribology Conference.

Mr. Marscher has written eight handbook chapters for various major engineering handbooks, which have focused on pump and turbomachinery mechanical issues, including dynamics and vibration. In previous employ, he was a senior engineer for the Bendix Fuel Pump and EFI Division (maker of automotive electric motor driven plunger/piston pumps and fuel injection systems, now a Honeywell division), a senior engineer for Pratt & Whitney Aircraft Engines, Director of Mechanics (Mechanical Engineering) for Worthington Pump HQ, and Manager of Engineering Mechanics for Dresser Worthington Pump Division after their acquisition of Worthington. Later, he was VP of the independent pump and turbomachinery developer Concepts NREC, from which 25 years ago he spun off Mechanical Solutions, Inc. as an independent pump and turbomachinery technology company. He has since become a charter Standards Partner for the Hydraulic Institute (HI), the trade association for the pump industry, became Vice Chair of the pump vibration technical committee for HI, and was HI Standards Partner of the Year for 2018, based on playing a significant role in the 9.6.4 and new 9.6.8 standards. He also won the Vibration Institute MFPT Frarey Award for Diagnostics Excellence.

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Mechanical Solutions, Inc.
Engineering Analysis, Test & Technology

Education: B.S.M.E. Cornell University, 1970
Master Eng. (Mech. Des.) Cornell University, 1972
M.Sc. Applied Mechanics, Rensselaer Polytechnic Institute, 1976

Experience:

Bendix Corp., MI (now Honeywell), 1970- 1973, Engineer, advanced concepts development and system modeling, and advanced sensor development for pumps and fuel injection systems
Pratt & Whitney Aircraft, CT, 1973-1980, Senior Engineer, aircraft engine compressor and turbine section mechanical development, analysis, and testing
Dresser Worthington Pump Div., Dresser Industries, NJ, 1980-1992, Manager and Director, Mechanical Engineering, in charge of mechanical design oversight for centrifugal & PD pumps
Concepts NREC, Inc., Norwich VT, 1992-1996, Vice President and Chief Mechanical Engineer
Mechanical Solutions, Inc., 1996- Present, Founder, CEO, and Senior Consultant

Honors:

NASA Fellow, Cornell University, 1971-1972, original Mars Rover Design project
1983 ASLE Best Technical Paper Award
1986 $5000 Dresser Pump Creativity Award for Vibration Evaluation Methodology
Fellow & Past President, Society of Tribologists and Lubrication Engineers (STLE)
Fellow & Past President/ Board Chairman MFPT Engineering Society
Associate Editor for 18 years, STLE *Tribology Transactions* magazine
Chapters for 8 Technical Handbooks
Author of 6 U.S. Patents & 1 European Patent
Charter Standards Partner for the Hydraulic Institute, past V. Chairman Vibration Committee
2018 ANSI/HI Standards Partner of the Year
2019 Jack L. Frarey Machinery Dagnostics Achievement Award of the Vibration Institute/MFPT
Registered and Licensed Professional Engineer, State of New Jersey Lic. No. 40626

Publications and Short Courses

Mr. Marscher's eight machinery handbook chapters include the 2nd and 3rd Edition of the Sanks Pumping Station Design Handbook, the structural engineering chapter for Sawyer's Gas Turbine Handbook, the Lubrication and Bearings section of The Modern Marine Engineer's Manual 3rd Edition, and the vibration test and predictive maintenance chapters for the CRC Lubrication & Tribology Handbooks, as well as the handbook pump and turbomachinery tribology chapter. He authored the pump mechanical behavior section of the McGraw-Hill Pump Handbook, 4th Edition, and the pump erosion and wear chapter for the ASM Materials Handbook. He has given short courses and tutorials on pump vibration and rotating machinery mechanical evaluation and troubleshooting twelve times at the Texas A&M Pump Symposium, and also at the U. of Virginia, the von Karman Institute in Belgium, the Sumy Institute Ukraine, IMechE in London, STLE, and the Vibration Institute and MFPT. He has published a large number of refereed technical papers, and was co-author the book Centrifugal Pump Design & Application, published by Oxford University Press (Oxford, England).

Additional Selected Publications:

Marscher, W.D., "*A Phenomenological Model of Abradable Seal Wear in High Performance Machinery*", Wear Magazine, v. 59, 1980 pp. 191-211

Marscher, W.D., "*A Critical Evaluation of the Flash Temperature Concept*", ASLE Hodson Best Paper Award Winner, ASLE Annual Meeting, Preprint No. 81-AM-1D-3, May 1981

Marscher, W.D., "*Thermal vs. Mechanical Effects in High Speed Sliding*", Wear Magazine, v. 79, pp 129-143, 1982

Marscher, W. D., "*Test Simulation of Turbomachinery Rotor/ Stator Interactions at Seals*," ASLE Annual Meeting, May 1982, featured article in Lubrication Engineering magazine, v. 39, no. 9, pp 577-583, September 1983.

Marscher, W.D., "*Structural Design and Analysis of Modern Turbomachinery Systems*", Chap. 7, Sawyer's Gas Turbine Engineering Handbook, 3rd Ed., v. I, Turbomachinery Publications, Norwalk CT, c. 1985

Marscher, W.D., "*The Effect of Fluid Forces at Various Operation Conditions on the Vibrations of Pumps*", Proc. IMechE, Radial Loads and Axial Thrusts, Feb 5 1986

Marscher, W.D., "*Determination of Pump Rotor Critical Speeds During Operation through Use of Modal Analysis*", Proc ASME 1986 WAM Symposium on Troubleshooting Methods and Technology, Anaheim Cal, Dec 1986

Marscher, W.D., "*The Relationship Between Pump Rotor System Tribology and Appropriate Vibration Specifications*", Proc IMechE 3rd European Congress on Fluid Machinery for the Oil and Petrochemical Industries, The Hague, Netherlands, May 1987

Marscher, W.D., "*Subsynchronous Vibration in Boiler Feed Pumps Due to Stable Response to Hydraulic Forces at Part Load*", Proc IMechE Conf on Part Load Pumping Control and Behavior, Edinburgh Scotland, Sept. 1988

Marscher, W. D., "*Analysis and Test of Multistage Pump 'Wet' Critical Speeds*," ASME/STLE Joint Lubrication Conference, 1989, Preprint 89-GT-6E-1, October 1989.

Marscher, W.D., "*The Effect of Variable Frequency Drives on Vibration Problems in Vertical Pumps"*, Proc. Water & Wastewater Conference, Barcelona, Spain, April 1990

Marscher, W.D., "*Vibration Test and Analysis of a Barrel Boiler Feed Pump Exhibiting Non-Synchronous Vibration*", Proc IMechE Seminar on Vibrations in Pumps, London, Dec. 1990

Marscher, W.D., "*The Use of Impact Testing to Solve Vibration Problems in Power Plant Pumps*," EPRI Reliability Symposium, Tampa, FL, June 1991.

Marscher, W.D., "*Advanced Vibration Analysis and Test Technology for Pumps*," Conf. on Vibration and Sealing in Centrifugal Machinery, Sumy Technical Institute, Ukraine, Sept. 1991

Marscher, W.D., "Make Vibration Monitoring Live Up to Its Potential", Power magazine, pp 54-57, July 1994

Marscher, W.D., "Wear and Erosion of Pumps" Chapter of the ASM Handbook, vol. 18, pp 65-1 to 65-9, c. 1995

Marscher, W.D., "*Vibration*" Chapter and "*Predictive Maintenance*" Chapters, STLE/CRC Tribology & Lubrication Handbook, STLE Park Ridge IL, 1994 & 1997

Marscher, W.D., "*Bearing Application and Lubrication*" Chapter, Modern Marine Engineer's Manual 3rd Edition, Cornell Maritime Press Centreville MD, 1999
Marscher, W.D., "*Electric Current Modal Impulses to Detect Motor-Driven Pump Rotor Condition*", Proc. 17th Int'l Modal Analysis Conf., Kissimmee FL, Feb. 1999
Marscher, W.D., "*The Determination of Rotor Critical Speeds While Pump Remains Operating, through Use of Impact Testing*", IMAC Conf. Orlando FL, SEM, Feb. 1999
Marscher, W.D., "*Avoiding Failures in Pumps*", Tutorial in Proc. TAMU International Pump Symposium, Houston TX, Feb. 2002
Marscher, W.D., "*The Relationship of Vibration to Problems in Pumps*", Cover Story in Chemical Engineering magazine, pp 38-44, May 2004
Marscher, W.D., & Hogg, Stephen, "*Use of Non-Contact Acoustic Signals as Metrics for Machinery Diagnostics*", Proc. 2006 MFPT Annual Meeting, Virginia Beach VA, May 2006
Marscher, W.D., "*An End-User's Guide to Pump Rotordynamics*", Proc. Texas A&M 23rd International Pump Symposium, Houston TX, March 2007, and presented annually since then up through Sept. 2020.
Marscher, W.D., and Kelly, W.J., "*Machinery Prognosis Based on Finite Element, Tribological, and Fatigue Analysis Calibrated by Test*", Proc. 2009 MFPT Annual Meeting, Dayton OH, May 2009
Marscher, W.D., & Kelly, W.J., "*Advanced Diagnostics & Prognostics of Plant Machinery*", Proc. 2010 MFPT Annual Meeting, Huntsville AL, April 2010
Marscher, W.D., "*Turbomachinery Tribology*" Chapter, STLE/CRC Tribology & Lubrication Handbook Vol.3, STLE Park Ridge IL, 2011
Marscher, W.D., "Vibration Detection Using Motion Magnification Video", Vibration Institute Annual Meeting, New Orleans LA, 2018
Marscher, W.D., "Effects of Operating Pumps at Off-Design Flows and Speeds", Hydraulic Institute Annual Meeting, Florida, 2018.
Marscher, W.D., Onari, M.M., Boyadjis, P.A., Olson, E.J., Lerche, A., "*Vibration of Pumps and Turbomachinery*", Short Course Texas A&M International Pump Symposium, Houston TX, March 2002, and presented annually since then up through Sept. 2020

Prior Legal Cases Last 8 Years:

1. Expert opinion, declaration, and deposition regarding validity of reciprocating pump valve patent No. 7,121,812.
   Attorney: Jessica E. Zilberberg, Carlson Gaskey & Olds, P.C., Birmingham Michigan
   Tel. (248) 988-8360, jzilberberg@cgolaw.com

2. Expert opinion and deposition concerning Sulzer submersible pump failures due to problems in the pump specification requirements versus actual needs (the wrong flow rate was

specified for the pump) and problems with the sump design. I supported Sulzer over a year's time in their succesxful defense. I was their primary technical witness.
Attorney: Michael Hanahan,Schiff Hardin LLP, Chicago IL, Tel: 312-258-5701.

3. Expert opinion and written declaration concerning failure of a Viking positive displacement pump for the making of peanut butter cup candy, which resulted in gross contamination resulting in a great deal of lost product and an extended period of lost production, as well as clean-up and repair costs. The liability amounted to 16 million dollars. The system should have been outfitted with sensors and controls, and should have had a provision for venting of discharge overpressure to avoid such catastrophes. After two years of mediation, the claim was able to be settled for only one percent of the original claim. My testimony composed the primary argument for our ultimately successful case.
Attorney: Timothy Mattson, Frith Andeerson & Peake, Roanoke VA, Tel. 540-725-3380.

4. Expert engineering guidance in a case involving a large skyscraper, advising concerning a valve that was part of a system that flooded the building because of improper system design.
Attorney: Len Lesser, Simon-Lesser PC, New York, NY, Tel: 212-599-5455.

5. Expert engineering guidance in a case involving a leakage in a cooling assembly and piping in another large skyscraper, advising concerning a pipe joint breakage that flooded the building because of disconnected alarms. Attorney: Len Lesser, Simon-Lesser PC, New York, NY, Tel: 212-599-5455

6. Expert testimony (2-day deposition as well as testify in court, and provide expert guidance) concerning a Moyno pump/ gear/ motor set that was not properly sized in accordance with specifications, leading to chronic trips. Testified at trial, 2014, Attorney: David Romyn, Castle Law Associates, Los Angeles CA.

7. Expert testimony, including Declaration, on behalf of Siemens in their "Longview" case concerning a large steam turbine generator enduring hydrogen seal failures. Case was in 2014, attorneys were Robert Wolinsky, and David Michaeli, of Hogan Lovells in Washington DC.

8. Expert testimony, including Declaration, as well as detailed engineering calculations concerning a fire in an Aluminum plant in Qatar, which the Norwegian/British insurance company was refusing to pay the insurance money due because of relatively high prior vibration in a large fan assembly. The insurance company (which was the opposition) settled out of court for nearly the full amount due. Case was throughout most of 2013. Attorneys Vasilis Pappas and John Craig of Bennett-Jones of Calgary Alberta Canada.

9. Patent Declaration Concerning GIW Patent (Addie et al), DIVERTER FOR REDUCING WEAR IN A SLURRY PUMP, Filed: August 6, 2002, Examiner: Richard A. Edgar, Atty. Scott Sudderth of Womble Carlyle Sandridge & Rice, PLLC, Winston-Salem NC. Case was litigated in 2011/2012. W. Marscher provided expert testimony by declaration.

10. Evaluation of John Crane Mechanical Seal Failures in Sharpe Mixers, Preg O'Donnell & Gillette PLLC, Seattle WA, Atty. John Butler , 2010/2011. W. Marscher provided mechanical seal damage deposition and expert opinion/ declaration.

Prior Legal Cases Before 2010:

HARTLINE, DACUS, BARGER, DREYER, & KERN, LLP

6688 North Central Expressway, Suite 1000

Dallas, Texas 75230

Tel: 214-346-3723

Atty – Edward Davis

Dresser-Rand vs. Equistar Chemical Company. W. Marscher provided expert consulting and compressor design and impeller stresses, and was prepped for trial (settled before testimony).

GRAHAM CURTIN, P.A.
4 Headquarters Plaza
Morristown, NJ 07962

Atty. – Tom Curtin- 973-401-7159

Case was about pulsating/ vibrating system including a positive diisplacement screw compressor that BASF claimed was a faulty design, 2005, W. Marscher provided expert consulting for Dover legal team. Case was Dover/A-C Compressor vs. BASF, Excessive Acoustic Pulsation/ Vibration of Screw Compressor System.

GROTEFELD & DENENBERG, L.L.C.
105 West Adams Street
Suite 2300
Chicago, IL 60603

Atty. - Shantel Woods – 312-601-2374
Case was NJ Building vs. the Sloan Flusher Valve Co., 2003,
W. Marscher provided expert consulting for NJ Building legal team, and performed deposition.

HOLCOMB & MAYTS, P.A.
Attorneys & Counselors at Law
106 S. Tampania Ave., Ste. 200
Tampa, FL 33609

Atty – Andrew Mayts - 813-874-8800
Case was Engine Systems, Inc. vs. Ingersoll-Dresser Pump Company, about 2002,
W. Marscher provided expert consulting for IDP legal team

ROETZEL & ANDRESS Law Firm
1 Seagate, Suite 999
Toledo, OH 43604-4504

Atty – Thomas Zaremba - 419-242-7985
Case was Nuclear Operating Co. v. Johnston Pump, about 2001,
MSI provided expert consulting for NOC legal team on Johnston Pump impeller failures at First Energy Perry Nuclear Plant

FAEGRE & BENSON LLP, Minneapolis MN

Atty. - Jerry Snider
Helicopter Engine Dynomometer, W. Marscher provided at-trial witness testimony in federal court for the Kahn Industries legal team, 1996

McNeer LLP, Clarksburg WV

Atty. - James Riley
Ionics RO Water Systems, T & T vertical pump and water-filled motor thrust bearing failures, W. Marscher provided at-trial witness testimony in state court for the Ionics legal team, 1996/1997